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(REV. 11-2000)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

3286-0174P

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

09/936995

INTERNATIONAL APPLICATION NO.

PCT/DE00/00696

INTERNATIONAL FILING DATE

March 6, 2000

PRIORITY DATE CLAIMED

March 19, 1999

TITLE OF INVENTION

DIGITAL SIGNAL TRANSMISSION SYSTEM FOR BUILDINGS SYSTEMS ENGINEERING

APPLICANT(S) FOR DO/EO/US

BITZL, Guenther; ZEMPELIN, Jens; SCHADE, Bernd

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1).
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau). WO 00/57603
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is transmitted herewith.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4)
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 20. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98-1449 and International Search Report (PCT/ISA/210) and German Search Report w/ 8 documents
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A **FIRST** preliminary amendment.
14. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
15. ☒ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:
 - 1.) PCT Substitute Claims Letter w/ amended claims
 - 2.) Two (2) sheets of Formal Drawings

U.S. APPLICATION NO (if known, see 37 CFR 1.53) 097936995		INTERNATIONAL APPLICATION NO PCT/DE00/00696		ATTORNEY'S DOCKET NUMBER 3286-0174P	
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<p>21. <input checked="" type="checkbox"/> The following fees are submitted:</p> <p>BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO. \$1,000.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00</p> <p>International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO. \$710.00</p> <p>International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00</p> <p>International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4). \$100.00</p> <p>ENTER APPROPRIATE BASIC FEE AMOUNT =</p> <p>Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th style="width:15%;">CLAIMS</th> <th style="width:20%;">NUMBER FILED</th> <th style="width:20%;">NUMBER EXTRA</th> <th style="width:20%;">RATE</th> <th style="width:25%;"></th> </tr> <tr> <td>Total Claims</td> <td>20 - 20 =</td> <td>0</td> <td>X \$18.00</td> <td>\$ 0</td> </tr> <tr> <td>Independent Claims</td> <td>1 - 3 =</td> <td>0</td> <td>X \$80.00</td> <td>\$ 0</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>None + \$270.00</td> <td>\$ 0</td> </tr> </table> <p>TOTAL OF ABOVE CALCULATIONS = \$ 860.00</p> <p><input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. \$ 0</p> <p>SUBTOTAL = \$ 860.00</p> <p>Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)). \$ 0</p> <p>TOTAL NATIONAL FEE = \$ 860.00</p> <p>Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property + \$ 40.00</p> <p>TOTAL FEES ENCLOSED = \$ 900.00</p> <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:60%;"></td> <td style="width:20%; text-align: right;">Amount to be:</td> <td style="width:20%; text-align: center;">\$</td> </tr> <tr> <td></td> <td style="text-align: right;">refunded</td> <td></td> </tr> <tr> <td></td> <td style="text-align: right;">charged</td> <td style="text-align: center;">\$</td> </tr> </table>	CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		Total Claims	20 - 20 =	0	X \$18.00	\$ 0	Independent Claims	1 - 3 =	0	X \$80.00	\$ 0	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			None + \$270.00	\$ 0		Amount to be:	\$		refunded			charged	\$	<p>CALCULATIONS</p> <p>PTO USE ONLY</p>
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a. ☒ A check in the amount of \$ **900.00** to cover the above fees is enclosed.

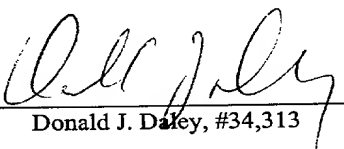
b. ☐ Please charge my Deposit Account. No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
overpayment to Deposit Account No. 02-2448.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR
1.137(a) or (b)) must be filed and granted to restore the application to pending status.

Send all correspondence to:
Birch, Stewart, Kolasch & Birch, LLP or Customer No. 2292
P.O. Box 747
Falls Church, VA 22040-0747
(703)205-8000

Date: September 19, 2001

By 
Donald J. Daley, #34,313

09/936995
JC03 Rec'd PCT/PTO 19 SEP 2001

PATENT
3286-0174P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicants: Guenter BITZL et al.
Application No.: NEW
Filed: September 19, 2001
For: DIGITAL SIGNAL TRANSMISSION SYSTEM FOR BUILDINGS
SYSTEMS ENGINEERING

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

September 19, 2001

Sir:

The following preliminary amendments and remarks are respectfully submitted in connection with the above-identified application.

IN THE ABSTRACT

Please replace the Abstract with the attached revised Abstract.

IN THE SPECIFICATION

Please replace the original specification with the Substitute Specification attached hereto.

IN THE CLAIMS

Please replace the original claims with the following new claims:

1. (Amended) A coupling appliance for a signal transmission system comprising:
a coupling element including an interface and connectable to a bus, to which appliances can be connected, the coupling element further including a plurality of connection slots for connecting at least one of modules having generic functions for appliances and appliances having generic

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functions, the coupling element further serving as a power and information supply for the appliances and functions, wherein

the coupling element includes a plurality of permanent functions for connectable appliances and associated connection slots, functions being individually definable in at least one of appliances and modules for appliances by information messages on the bus, and wherein the input of the coupling element includes a connection slot including a supervisory module for the power supply from an external network conductor.

2. (Amended) The signal transmission system as claimed in claim 1, wherein the supervisory module is provided with a protective element in the form of a fine-protection element for appliances.

3. (Amended) The signal transmission system as claimed in claim 1, wherein the supervisory module is in the form of a test rig for at least one of current and voltage.

4. (Amended) The signal transmission system as claimed in claim 3, wherein the supervisory module is in the form of a control center for power management.

5. (Amended) The signal transmission system as claimed in claim 1, wherein the connection slots of the coupling element are provided with at least one complementary coupling element, this complementary coupling element using basic functions of the coupling element.

6. (Amended) The signal transmission system as claimed in claim 1, wherein the connection slots are in the form of plug-in slots.

Please add the following new claims:

-- 7. The signal transmission system as claimed in claim 2, wherein the supervisory module is in the form of a test rig for at least one of current and voltage.

8. The signal transmission system as claimed in claim 7, wherein the supervisory module is in the form of a control center for power management.

9. The signal transmission system as claimed in claim 2, wherein the connection slots of the coupling element are provided with at least one complementary coupling element, this complementary coupling element using basic functions of the coupling element.

10. The signal transmission system as claimed in claim 3, wherein the connection slots of the coupling element are provided with at least one complementary coupling element, this complementary coupling element using basic functions of the coupling element.

11. The signal transmission system as claimed in claim 4, wherein the connection slots of the coupling element are provided with at least one complementary coupling element, this complementary coupling element using basic functions of the coupling element.

12. The signal transmission system as claimed in claim 7, wherein the connection slots of the coupling element are provided with at least one complementary coupling element, this complementary coupling element using basic functions of the coupling element.

13. The signal transmission system as claimed in claim 8, wherein the connection slots of the coupling element are provided with at least one complementary coupling element, this complementary coupling element using basic functions of the coupling element.

14. The signal transmission system as claimed in claim 2, wherein the connection slots are in the form of plug-in slots.

15. The signal transmission system as claimed in claim 3, wherein the connection slots are in the form of plug-in slots.

16. The signal transmission system as claimed in claim 4, wherein the connection slots are in the form of plug-in slots.

17. The signal transmission system as claimed in claim 5, wherein the connection slots are in the form of plug-in slots.

18. The coupling appliance of claim 1, wherein the appliances function as at least one of an actuator, a sensor, and an evaluation unit.

19. The coupling appliance of claim 1, wherein the permanent functions include switching.

20. The coupling appliance of claim 1, wherein the coupling appliance is for a signal transmission system for building systems engineering. --

REMARKS

Claims 1-20 are now present in this application, with new claims 7-20 being added by the present Preliminary Amendment. It should be noted that the amendments to original claims 1-6 of the present application are non-narrowing amendments, made solely to place the claims in proper form for U.S. practice and not to overcome any prior art or for any other statutory considerations. For example, amendments have been made to broaden the claims; to remove

reference numerals in the claims; remove the European phrase “characterized in that”; remove multiple dependencies in the claims; and to place claims in a more recognizable U.S. form, including the use of the transitional phrase “comprising” as well as the phrase “wherein”. Other such non-narrowing amendments include changing the phrase “and/or” to --at least one of--, and reorganizing apparatus claims (elements set forth in separate paragraphs) in a more recognizable U.S. form. Again, all amendments are non-narrowing and have been made solely to place the claims in proper form for U.S. practice and not to overcome any prior art or for any other statutory considerations.

SUBSTITUTE SPECIFICATION

In accordance with 37 C.F.R. §1.125, a substitute specification has been included in lieu of substitute paragraphs in connection with the present Preliminary Amendment. The substitute specification is submitted in clean form, attached hereto, and is accompanied by a marked-up version showing the changes made to the original specification. The changes have been made in an effort to place the specification in better form for U.S. practice. No new matter has been added by these changes to the specification. Further, the substitute specification includes paragraph numbers to facilitate amendment practice as requested by the U.S. Patent and Trademark Office.

CONCLUSION

Accordingly, in view of the above amendments and remarks, an early indication of the allowability of each of claims 1-20 in connection with the present application is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Donald J. Daley at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By: _____

Donald J. Daley, Reg. No. 34,313

DJD:kna

P.O. Box 747
Falls Church, VA 22040-0747
(703) 205-8000

ABSTRACT OF THE DISCLOSURE

A digital signal transmission system is for buildings systems engineering, and is for information messages. In such a system, appliances can be connected to a bus using coupling elements which have interfaces. The coupling element is provided with a number of permanent functions for appliances and associated connection slots for devices having user interfaces. It is provided with a number of connection slots for connecting modules having generic functions for appliances. The coupling element preferably carries and distributes power for the appliances and functions and information, wherein the coupling element is preferably designed to use information messages on the bus to define functions in appliances and modules for appliances on an individual basis.

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Description

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part 1
Digital signal transmission system for buildings
systems engineering

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FIELD OF THE INVENTION *generally*
The invention relates to a digital signal transmission system, for buildings systems engineering, for information messages, in which user appliances, for example having the generic function of actuator and/or

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sensor and/or evaluation unit, can be connected to a bus using coupling elements which have interfaces. *more preferably, it relates to such a system*
BACKGROUNDOF THE INVENTION

In a known system, user appliances are connected to the bus using bus couplers (EP-B-0 365 696). Such a bus coupler has components for physical connection to the bus and

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for transmitting information messages - and *Tr also* *yes*
components for communication and for user-related intelligence. "User appliances" or terminals can then be connected thereto. In this context, one bus coupler with comprehensive functions is provided per connection

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point.

On the basis of another known digital signal transmission system for corresponding terminals, universal interfaces independent of function are used which, together with the bus, are part of the basic installation. These universal interfaces have external function-determining appliance adapters attached to them, which accordingly need to be made available with extensive functions.

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SUMMARY OF THE INVENTION

The invention is based on the object of developing a digital signal transmission system for buildings systems engineering which requires permanent or extensive functions neither on the part of the user nor

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on the bus.

above, and/or other objects,
The object outlined is achieved by a digital signal transmission system for buildings systems engineering in accordance with claim 1. In this context, the

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coupling element is provided with a number of permanent functions for user appliances, e.g. switching, and associated connection slots for user appliances. The

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coupling element is also provided with a number of connection slots for connecting modules having generic functions for user appliances. Generic functions may be: ^{for example} actuator function, and/or sensor function, and/or evaluation function, and/or telephone function, and/or television functions. The coupling elements can also be designed for connecting appliances having generic functions. A coupling element is respectively designed to carry and distribute power for user appliances and/or user functions and information. In addition, the coupling elements are designed to use information messages on the bus to define functions in user appliances and/or modules for user appliances on an individual basis.

15 The coupling elements are thus provided with a number of permanent functions for connecting user appliances. ^{preferably} they also have connection slots to which modules or ~~else~~ appliances can be connected directly. Hence, only
20 rudimentary functions need to be provided for each coupling slot on the bus. The other functions can be provided individually by connecting modules to which user interfaces or appliance parts are connected ~~or~~ ^{attached} ~~to a~~ ^{to} ~~the~~ ^{the} ~~connection~~ ^{connection} slots. User appliances can also be connected
25 directly to the connection slots.

In accordance with one development, a connection slot for a supervisory module can be produced on the coupling element at the power supply input. The
30 supervisory module can be provided with a fine-protection element for user appliances. It can also be in the form of a test rig for current and/or for voltage. The supervisory module can also be in the form of a control center for power management. Accordingly,
35 safety functions or control functions can additionally be provided from the point of view of power management.

The connection slots of the coupling element can be extended by further fittable complementary coupling

elements. These complementary coupling elements can use basic functions of the coupling element to which they are

Figure 1 consists of 12 bar charts, labeled (a) through (l), arranged in a 4x3 grid. Each chart displays the percentage of total protein for various protein types (A, B, C, D, E, F, G, H, I, J, K, L) across different conditions (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12). The y-axis for all charts is 'Percentage of total protein' ranging from 0 to 100. The x-axis for all charts is 'Protein type' with labels A, B, C, D, E, F, G, H, I, J, K, L. The bars are color-coded by fraction: A (white), B (light gray), C (medium gray), D (dark gray), E (black), F (white), G (light gray), H (medium gray), I (dark gray), J (black), K (white), L (light gray). The data is summarized in the following table:

Chart	Protein Type	Condition 1	Condition 2	Condition 3	Condition 4	Condition 5	Condition 6	Condition 7	Condition 8	Condition 9	Condition 10	Condition 11	Condition 12
(a)	A	10	20	30	40	50	60	70	80	90	100	110	120
	B	10	20	30	40	50	60	70	80	90	100	110	120
	C	10	20	30	40	50	60	70	80	90	100	110	120
	D	10	20	30	40	50	60	70	80	90	100	110	120
	E	10	20	30	40	50	60	70	80	90	100	110	120
	F	10	20	30	40	50	60	70	80	90	100	110	120
	G	10	20	30	40	50	60	70	80	90	100	110	120
	H	10	20	30	40	50	60	70	80	90	100	110	120
	I	10	20	30	40	50	60	70	80	90	100	110	120
	J	10	20	30	40	50	60	70	80	90	100	110	120
	K	10	20	30	40	50	60	70	80	90	100	110	120
	L	10	20	30	40	50	60	70	80	90	100	110	120
(b)	A	10	20	30	40	50	60	70	80	90	100	110	120
	B	10	20	30	40	50	60	70	80	90	100	110	120
	C	10	20	30	40	50	60	70	80	90	100	110	120
	D	10	20	30	40	50	60	70	80	90	100	110	120
	E	10	20	30	40	50	60	70	80	90	100	110	120
	F	10	20	30	40	50	60	70	80	90	100	110	120
	G	10	20	30	40	50	60	70	80	90	100	110	120
	H	10	20	30	40	50	60	70	80	90	100	110	120
	I	10	20	30	40	50	60	70	80	90	100	110	120
	J	10	20	30	40	50	60	70	80	90	100	110	120
	K	10	20	30	40	50	60	70	80	90	100	110	120
	L	10	20	30	40	50	60	70	80	90	100	110	120
(c)	A	10	20	30	40	50	60	70	80	90	100	110	120
	B	10	20	30	40	50	60	70	80	90	100	110	120
	C	10	20	30	40	50	60	70	80	90	100	110	120
	D	10	20	30	40	50	60	70	80	90	100	110	120
	E	10	20	30	40	50	60	70	80	90	100	110	120
	F	10	20	30	40	50	60	70	80	90	100	110	120
	G	10	20	30	40	50	60	70	80	90	1		

connected. They then do not need to be designed for this purpose themselves.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be explained in more detail using exemplary embodiments shown in coarsely schematic form in the drawing, in which:

FIGURE 1 shows a coupling element having complementary coupling elements, a supervisory module and connectable modules for user appliances in the manner of an exploded illustration;

FIGURE 2 shows a perspective view of an arrangement of a coupling element and a supervisory module with a transparent view of illustrated conductors.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIGURE 1, a bus 2 is connected to a coupling element 1. On the power side, the coupling element 1 can have a supervisory module 3 connected upstream of it, to which network conductors 4 for supplying power are connected. The coupling element 1 can have complementary coupling elements 5 of a first type and complementary coupling elements 6 of a second type connected to it to extend the connection slots. The coupling element 1 is provided with a number of permanent functions for user appliances. For this purpose, its connection side 7 has connection slots 8 for devices having a user interface. The coupling element 1 also has connection slots 9 for connecting modules 10 having generic functions for user appliances. The modules 10 can also be part of a user appliance to which further appliance parts of the user appliance can be connected.

In the exemplary embodiment shown in FIGURE 1, a connection slot 11 for a supervisory module 3 is produced on the coupling element 1 at the power supply input. The supervisory module can have a fine-protection element for user appliances. It can also be in the form of a test rig for current and/or voltage.

The power supplied via network conductors 4 is supplied to appliance sections, connected at the connection slots 8 and 9, or to

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complete user appliances under appropriate monitoring. The supervisory module 3 can be in the form of a control center for power management. The connection slots of the coupling element 1 can be extended by
5 further fittable complementary coupling elements 5 and 6. The complementary coupling elements, of a first type 5 with a permanent function in one part of the area and of a second type 6 without permanent functions, can use basic functions of the coupling element 1. They then do
10 not need to be designed for this purpose themselves. Functions can be defined individually in user appliances and/or appliance sections or user interfaces or in modules for user appliances by means of information messages received via the bus 2.

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FIGURE 2 shows a perspective view of a coupling element 1 having a connected supervisory module 3 in the manner of an exploded illustration. The connection slots 8 and 9 of the coupling element 1 are in the form of plug-in
20 slots in the exemplary embodiment. In this case, the connection slots 8 in the exemplary embodiment are designed for power supply and, in the case of the connection slots 9, connections 12 are designed for power and connections 13 are designed for information
25 transmission. A connection slot 14 for complementary modules of the first type 5 and of the second type 6 is produced on the coupling element 1 in the exemplary embodiment after the fashion of the connection slot 11 for a supervisory module. As will be understood, a
30 complementary coupling element of the second type, 6, can also be connected to the connection slot 14 directly and not, as in FIGURE 1, indirectly via a complementary coupling element 5 of the first type.

Variations

What is claimed is:
~~Patent claims~~

(Amended)

1. A coupling appliance for a signal transmission system for buildings systems engineering, ^{comprising} [having] a coupling element (1) which has ^{including} an interface and which
- 5 - can be connected ^{connectable} to a bus (2) and, to which [user] appliances, for example having the generic function of actuator and/or sensor and/or evaluation unit, can be
- 10 connected, ~~wherein~~ ^{the coupling element further includes} the coupling element further includes
- [- is provided [lacuna] a ^{plurality} number of connection slots (9) for connecting ^{at least one of} modules (10) having generic functions for [user] appliances, and/or is designed for connecting
- 15 appliances having generic functions, [and] ^{the coupling element} the coupling element
- [- serves ^{further serving} as a power and information supply for the [user] appliances and [user] functions, ^{wherein} wherein

20 [characterized

- in that ^a the coupling element (1) has ^{includes} a ^{plurality} number of permanent functions for connectable [user] appliances, [e.g. switching, and associated connection slots (8),
- 25 functions being individually definable ^{at least one of} in [user] appliances and/or modules (10) for [user] appliances by [means of] information messages on the bus, and ^{wherein} wherein
- [in that] the input of the coupling element (1) has ^{includes} a connection slot (11) having ^{including} a supervisory module (3) for the power supply from an external network conductor
- 30 (4).
- (Amended)
2. The signal transmission system as claimed in claim
- 35 1, characterized in that ^{wherein} the supervisory module (3) is provided with a protective element in the form of a fine-protection element for [user] appliances.

3. ^(Amended) The signal transmission system as claimed in claim 2
or 1, characterized in that ^{wherein} the supervisory

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module (3) is in the form of a test rig for ^{at least one of} current and/or voltage.

(Amended)
4. The signal transmission system as claimed in claim 3, characterized in that ^{wherein} the supervisory module (3) is in the form of a control center for power management.

(Amended)
5. The signal transmission system as claimed in ^{claim} one of claims 1 to 4, characterized in that ^{wherein} the connection slots (8, 9) of the coupling element (1) are provided with at least one complementary coupling element (5, 6), this complementary coupling element using basic functions of the coupling element (1).

(Amended)
6. The signal transmission system as claimed in ^{claim} one of claims 1 to 5, characterized in that ^{wherein} the connection slots (8, 9) are in the form of plug-in slots (8, 12, 13).

New claims

7. Same as 3, but dep on 2
8. Same as 4, but dep on 7
9. Same as 5, but dep on 2
10. " 5 " 3
11. " 5 " 4
12. " 5 " 7
13. " 5 " 8
14. Same as 6, but dep on 2
15. " 6 " 3
16. " 6 " 4
17. " 6 " 5

18. The coupling appliance of claim 1, wherein the appliances function as at least one of an actuator, a sensor, and an evaluation unit.
19. The coupling appliance of claim 1, wherein the permanent functions include switching.
20. The coupling appliance of claim 1, wherein the coupling appliance is for a signal transmission system for building systems engineering.

Abstract

Digital signal transmission system for buildings systems engineering

A digital signal transmission system⁵ for buildings systems engineering, ^{and is} for information messages, ^{in which} ^{in such a system,} user appliances, ~~for example having the generic function of actuator and/or sensor and/or evaluation unit,~~ can be connected to a bus (2) using coupling elements (1) which have interfaces. The invention ~~provides that the coupling element (1) is provided with a number of permanent functions for user appliances, e.g. switching, and associated connection slots (8) for devices having user interfaces,~~ ^{It} and ^{is} provided with a number of connection slots (9) for connecting modules (10) having generic functions for user appliances, ~~the modules (10) [lacuna] with an actuator function and/or sensor function and/or evaluation function, telephone function, [lacuna] television function is provided, and/or is designed for connecting appliances having generic functions, where the coupling element~~ ^{carries} and distributes power for the user appliances ~~and/or user~~ ^{and} functions and information, ~~and where the coupling element (1) is~~ ^{preferably} designed to use information messages on the bus to define functions in ~~user appliances and/or modules (10) for user appliances on an individual basis.~~ ^{and}

FIGURE 1

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SUBSTITUTE SPECIFICATION

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DIGITAL SIGNAL TRANSMISSION SYSTEM FOR BUILDINGS SYSTEMS ENGINEERING

[0001] This application is the national phase under 35 U.S.C. § 371 of PCT International Application No. PCT/DE00/00696 which has an International filing date of March 6, 2000, which designated the United States of America, the entire contents of which are hereby incorporated by reference.

Field of the Invention

[0002] The invention generally relates to a digital signal transmission system, for buildings systems engineering, for information messages. More preferably, it relates to such a system in which user appliances, for example having the generic function of actuator and/or sensor and/or evaluation unit, can be connected to a bus using coupling elements which have interfaces.

Background of the Invention

[0003] In a known system, user appliances are connected to the bus using bus couplers (EP-B-0 365 696). Such a bus coupler has components for physical connection to the bus and for transmitting information messages. It also has components for communication and for user-related intelligence. "User appliances" or terminals can then be connected thereto. In this context, one bus coupler with comprehensive functions is provided per connection point.

[0004] On the basis of another known digital signal transmission system for corresponding terminals, universal interfaces independent of function are used which, together with the bus, are part of the basic installation. These universal interfaces have external function-determining appliance adapters attached to them, which accordingly need to be made available with extensive functions.

SUMMARY OF THE INVENTION

[0005] The invention is based on the object of developing a digital signal transmission system for buildings systems engineering which requires permanent or extensive functions neither on the part of the user nor on the bus.

[0006] The object outlined above, and/or other objects, is achieved by a digital signal transmission system for buildings systems engineering in accordance with claim 1. In this context, the coupling element is provided with a number of permanent functions for user appliances, e.g. switching, and associated connection slots for user appliances. The coupling

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element is also provided with a number of connection slots for connecting modules having generic functions for user appliances. Generic functions may be, for example: actuator function, and/or sensor function, and/or evaluation function, and/or telephone function, and/or television functions, etc. The coupling elements can also be designed for connecting appliances having generic functions. A coupling element is respectively designed to carry and distribute power for user appliances and/or user functions and information. In addition, the coupling elements are designed to use information messages on the bus to define functions in user appliances and/or modules for user appliances on an individual basis.

[0007] The coupling elements are thus provided with a number of permanent functions for connecting user appliances. They also preferably have connection slots to which modules or appliances can be connected directly. Hence, only rudimentary functions need to be provided for each coupling slot on the bus. The other functions can be provided individually by connecting modules to which user interfaces or appliance parts are connected or attached. User appliances can also be connected directly to the connection slots.

[0008] In accordance with one development, a connection slot for a supervisory module can be produced on the coupling element at the power supply input. The supervisory module can be provided with a fine-protection element for user appliances. It can also be in the form of a test rig for current and/or for voltage. The supervisory module can also be in the form of a control center for power management. Accordingly, safety functions or control functions can additionally be provided from the point of view of power management.

[0009] The connection slots of the coupling element can be extended by further fittable complementary coupling elements. These complementary coupling elements can use basic functions of the coupling element to which they are connected. They then do not need to be designed for this purpose themselves.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The invention will now be explained in more detail using exemplary embodiments shown in coarsely schematic form in the drawing, in which:

[0011] FIGURE 1 shows a coupling element having complementary coupling elements, a supervisory module and connectable modules for user appliances in the manner of an exploded illustration;

[0012] FIGURE 2 shows a perspective view of an arrangement of a coupling element and a supervisory module with a transparent view of illustrated conductors.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] In FIGURE 1, a bus 2 is connected to a coupling element 1. On the power side, the coupling element 1 can have a supervisory module 3 connected upstream of it, to which network conductors 4 for supplying power are connected. The coupling element 1 can have complementary coupling elements 5 of a first type and complementary coupling elements 6 of a second type connected to it to extend the connection slots. The coupling element 1 is provided with a number of permanent functions for user appliances. For this purpose, its connection side 7 has connection slots 8 for devices having a user interface. The coupling element 1 also has connection slots 9 for connecting modules 10 having generic functions for user appliances. The modules 10 can also be part of a user appliance to which further appliance parts of the user appliance can be connected.

[0014] In the exemplary embodiment shown in FIGURE 1, a connection slot 11 for a supervisory module 3 is produced on the coupling element 1 at the power supply input. The supervisory module can have a fine-protection element for user appliances. It can also be in the form of a test rig for current and/or voltage. The power supplied via network conductors 4 is supplied to appliance sections, connected at the connection slots 8 and 9, or to complete user appliances under appropriate monitoring. The supervisory module 3 can be in the form of a control center for power management. The connection slots of the coupling element 1 can be extended by further fittable complementary coupling elements 5 and 6. The complementary coupling elements, of a first type 5 with a permanent function in one part of the area and of a second type 6 without permanent functions, can use basic functions of the coupling element 1. They then do not need to be designed for this purpose themselves. Functions can be defined individually in user appliances and/or appliance sections or user interfaces or in modules for user appliances by means of information messages received via the bus 2.

[0015] FIGURE 2 shows a perspective view of a coupling element 1 having a connected supervisory module 3 in the manner of an exploded illustration. The connection slots 8 and 9 of the coupling element 1 are in the form of plug-in slots in the exemplary embodiment. In this case, the connection slots 8 in the exemplary embodiment are designed for power supply and, in the case of the connection slots 9, connections 12 are designed for power and connections 13 are designed for information transmission. A connection slot 14 for complementary modules of the first type 5 and of the second type 6 is produced on the coupling element 1 in the exemplary embodiment after the fashion of the connection slot 11 for a supervisory module. As will be understood, a complementary coupling element of the second type, 6, can also be connected to the connection slot 14 directly and not, as in FIGURE 1, indirectly via a complementary coupling element 5 of the first type.

[0016] The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

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Description

Digital signal transmission system for buildings systems engineering

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The invention relates to a digital signal transmission system, for buildings systems engineering, for information messages, in which user appliances, for example having the generic function of actuator and/or sensor and/or evaluation unit, can be connected to a bus using coupling elements which have interfaces. In a known system, user appliances are connected to the bus using bus couplers (EP-B-0 365 696). Such a bus coupler has components for physical connection to the bus and for transmitting information messages and also components for communication and for user-related intelligence. "User appliances" or terminals can then be connected thereto. In this context, one bus coupler with comprehensive functions is provided per connection point.

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On the basis of another known digital signal transmission system for corresponding terminals, universal interfaces independent of function are used which, together with the bus, are part of the basic installation. These universal interfaces have external function-determining appliance adapters attached to them which accordingly need to be made available with extensive functions.

30

The invention is based on the object of developing a digital signal transmission system for buildings systems engineering, which requires permanent or extensive functions neither on the part of the user nor on the bus.

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The object outlined is achieved by a digital signal transmission system for buildings systems engineering in accordance with claim 1. In this context, the

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coupling element is provided with a number of permanent functions for user appliances, e.g. switching, and associated connection slots for user appliances. The

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coupling element is also provided with a number of connection slots for connecting modules having generic functions for user appliances. Generic functions may be: actuator function and/or sensor function and/or evaluation function and/or telephone function and/or television functions. The coupling elements can also be designed for connecting appliances having generic functions. A coupling element is respectively designed to carry and distribute power for user appliances and/or user functions and information. In addition, the coupling elements are designed to use information messages on the bus to define functions in user appliances and/or modules for user appliances on an individual basis.

The coupling elements are thus provided with a number of permanent functions for connecting user appliances; they also have connection slots to which modules or else appliances can be connected directly. Hence, only rudimentary functions need to be provided for each coupling slot on the bus. The other functions can be provided individually by connecting modules to which user interfaces or appliance parts are connected or [lacuna]. User appliances can also be connected directly to the connection slots.

In accordance with one development, a connection slot for a supervisory module can be produced on the coupling element at the power supply input. The supervisory module can be provided with a fine-protection element for user appliances; it can also be in the form of a test rig for current and/or for voltage. The supervisory module can also be in the form of a control center for power management. Accordingly, safety functions or control functions can additionally be provided from the point of view of power management.

The connection slots of the coupling element can be extended by further fittable complementary coupling

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[illegible]

connected. They then do not need to be designed for this purpose themselves.

5 The invention will now be explained in more detail using exemplary embodiments shown in coarsely schematic form in the drawing, in which:

FIGURE 1 shows a coupling element having complementary coupling elements, a supervisory module and connectable modules for user appliances in the manner of an exploded illustration;

FIGURE 2 shows a perspective view of an arrangement of a coupling element and a supervisory module with a transparent view of illustrated conductors.

In FIGURE 1, a bus 2 is connected to a coupling element 1. On the power side, the coupling element 1 can have a supervisory module 3 connected upstream of it, to which network conductors 4 for supplying power are connected. The coupling element 1 can have complementary coupling elements 5 of a first type and complementary coupling elements 6 of a second type connected to it to extend the connection slots. The coupling element 1 is provided with a number of permanent functions for user appliances. For this purpose, its connection side 7 has connection slots 8 for devices having a user interface. The coupling element 1 also has connection slots 9 for connecting modules 10 having generic functions for user appliances. The modules 10 can also be part of a user appliance to which further appliance parts of the user appliance can be connected.

In the exemplary embodiment shown in FIGURE 1, a connection slot 11 for a supervisory module 3 is produced on the coupling element 1 at the power supply input. The supervisory module can have a fine-protection element for user appliances. It can also be in the form of a test rig for current and/or voltage.

The power supplied via network conductors 4 is supplied to appliance sections, connected at the connection slots 8 and 9, or to

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complete user appliances under appropriate monitoring. The supervisory module 3 can be in the form of a control center for power management. The connection slots of the coupling element 1 can be extended by further fittable complementary coupling elements 5 and 6. The complementary coupling elements, of a first type 5 with a permanent function in one part of the area and of a second type 6 without permanent functions, can use basic functions of the coupling element 1. They then do not need to be designed for this purpose themselves. Functions can be defined individually in user appliances and/or appliance sections or user interfaces or in modules for user appliances by means of information messages received via the bus 2.

FIGURE 2 shows a perspective view of a coupling element 1 having a connected supervisory module 3 in the manner of an exploded illustration. The connection slots 8 and 9 of the coupling element 1 are in the form of plug-in slots in the exemplary embodiment. In this case, the connection slots 8 in the exemplary embodiment are designed for power supply and, in the case of the connection slots 9, connections 12 are designed for power and connections 13 are designed for information transmission. A connection slot 14 for complementary modules of the first type 5 and of the second type 6 is produced on the coupling element 1 in the exemplary embodiment after the fashion of the connection slot 11 for a supervisory module. As will be understood, a complementary coupling element of the second type, 6, can also be connected to the connection slot 14 directly and not, as in FIGURE 1, indirectly via a complementary coupling element 5 of the first type.

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Patent claims

1. A coupling appliance for a signal transmission
system for buildings systems engineering, having a
5 coupling element (1) which has an interface and which

- can be connected to a bus (2) and to which user
appliances, for example having the generic function of
actuator and/or sensor and/or evaluation unit, can be
10 connected,

- is provided [lacuna] a number of connection slots (9)
for connecting modules (10) having generic functions
for user appliances, and/or is designed for connecting
15 appliances having generic functions, and

- serves as a power and information supply for the user
appliances and user functions,

20 characterized

in that the coupling element (1) has a number of
permanent functions for connectable user appliances,
e.g. switching, and associated connection slots (8),
25 functions being individually definable in user
appliances and/or modules (10) for user appliances by
means of information messages on the bus, and

in that the input of the coupling element (1) has a
30 connection slot (11) having a supervisory module (3)
for the power supply from an external network conductor
(4).

2. The signal transmission system as claimed in claim
35 1, characterized in that the supervisory module (3) is
provided with a protective element in the form of a
fine-protection element for user appliances.

AMENDED SHEET

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3. The signal transmission system as claimed in claim 2
or 1, characterized in that the supervisory

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module (3) is in the form of a test rig for current and/or voltage.

4. The signal transmission system as claimed in claim 3, characterized in that the supervisory module (3) is in the form of a control center for power management.

5. The signal transmission system as claimed in one of claims 1 to 4, characterized in that the connection slots (8, 9) of the coupling element (1) are provided with at least one complementary coupling element (5, 6), this complementary coupling element using basic functions of the coupling element (1).

6. The signal transmission system as claimed in one of claims 1 to 5, characterized in that the connection slots (8, 9) are in the form of plug-in slots (8, 12, 13).

Abstract

Digital signal transmission system for buildings systems engineering

A digital signal transmission system, for buildings systems engineering, for information messages, in which user appliances, for example having the generic function of actuator and/or sensor and/or evaluation unit, can be connected to a bus (2) using coupling elements (1) which have interfaces. The invention provides that the coupling element (1) is provided with a number of permanent functions for user appliances, e.g. switching, and associated connection slots (8) for devices having user interfaces, and is provided with a number of connection slots (9) for connecting modules (10) having generic functions for user appliances, the modules (10) [lacuna] with an actuator function and/or sensor function and/or evaluation function, telephone function. [lacuna] television function is provided, and/or is designed for connecting appliances having generic functions, where the coupling element carries and distributes power for the user appliances and/or user functions and information, and where the coupling element (1) is designed to use information messages on the bus to define functions in user appliances and/or modules (10) for user appliances on an individual basis.

FIGURE 1

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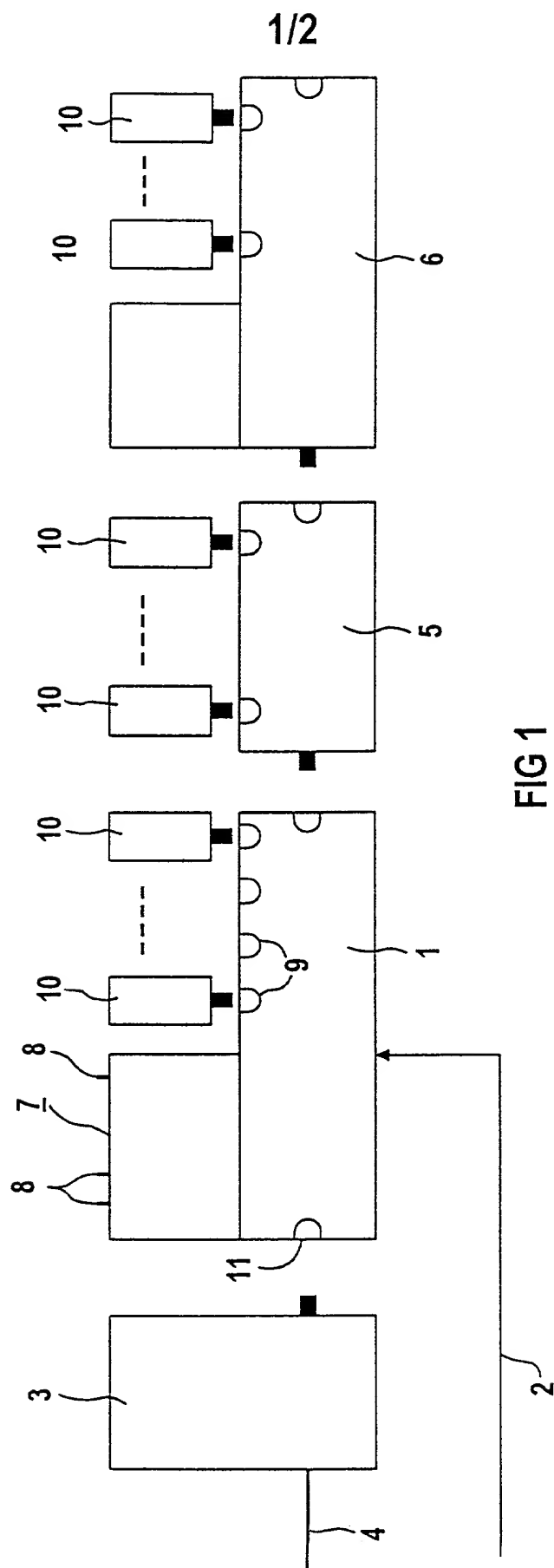
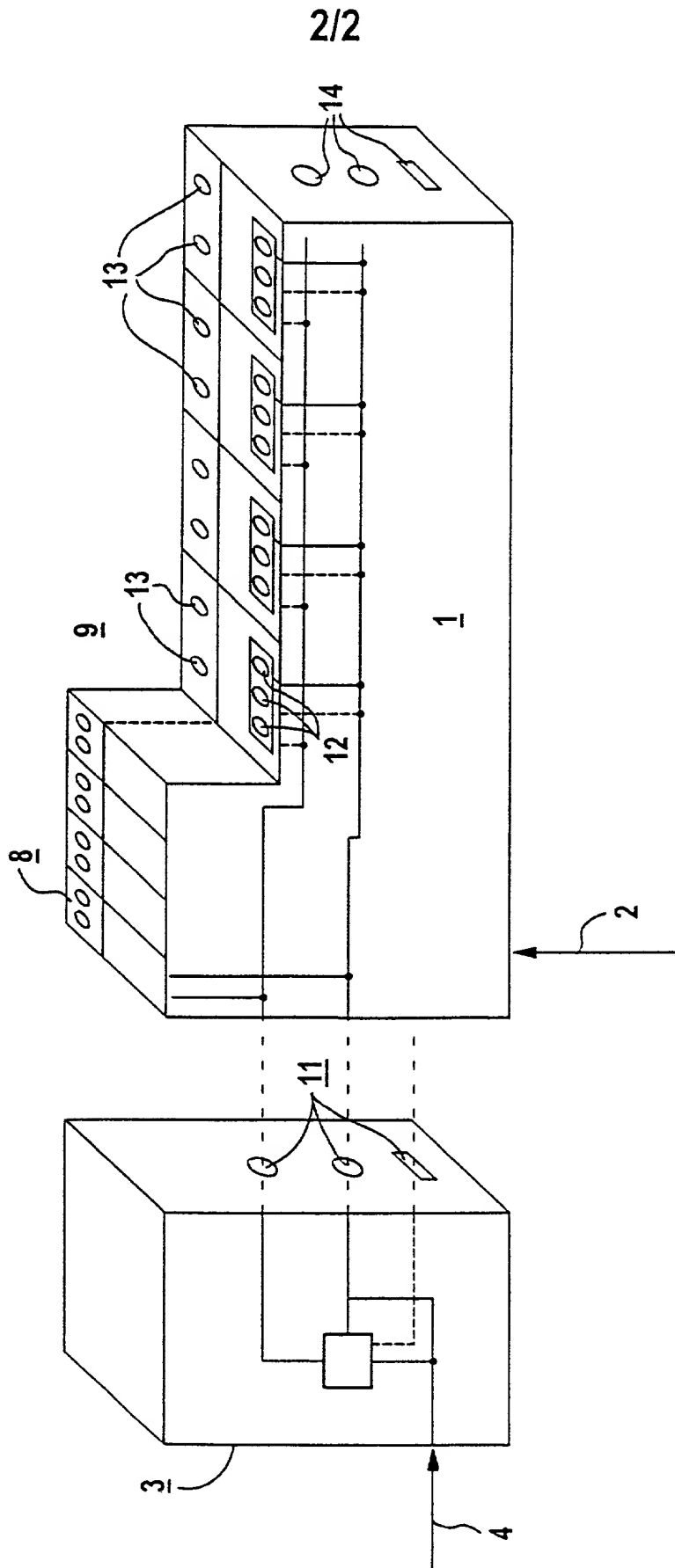


FIG 1



Declaration and Power of Attorney For Patent Application**Erklärung Für Patentanmeldungen Mit Vollmacht****German Language Declaration**

Atty Dckt No.: 3286-0174P

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

As a below named inventor, I hereby declare that:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

My residence, post office address and citizenship are as stated below next to my name,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Digitales Signalübertragungssystem der Gebäudesystemtechnik**Digital signal transmission system for building systems engineering**

deren Beschreibung

the specification of which

(zutreffendes ankreuzen)

(check one)

☐ hier beigefügt ist.

☐ is attached hereto.

☒ am 06.03.2000 als

☒ was filed on 06.03.2000 as

PCT internationale Anmeldung

PCT international application

PCT Anmeldungsnummer PCT/DE00/00696

PCT Application No. PCT/DE00/00696

eingereicht wurde und am

and was amended on (if applicable)

abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

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Priority Claimed

☐

No
Nein

☐ No
Nein☐ No
Nein

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

pending
(Status)
(patented, pending,
abandoned)

(Status)
(patented, pending,
abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

German Language Declaration

VERTRETUNGSVOLLMACHT: Als benannter Erfinder beauftrage ich hiermit den nachstehend benannten Patentanwalt (oder die nachstehend benannten Patentanwälte) und/oder Patent-Agenten mit der Verfolgung der vorliegenden Patentanmeldung sowie mit der Abwicklung aller damit verbundenen Geschäfte vor dem Patent- und Warenzeichenamt: (Name und Registrationsnummer anführen)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

Customer No. 02292

And I hereby appoint

Telefongespräche bitte richten an:
(Name und Telefonnummer)

Direct Telephone Calls to: (name and telephone number)

Ext. _____

Postanschrift:

Send Correspondence to:

Birch, Stewart, Kolasch & Birch, LLP
8110 Gatehouse Road / Suite 500 East 22042 Falls Church, Virginia
Telephone: +1 703 205 8000 and Facsimile +1 703 205 8050
 or
Customer No. 02292

Voller Name des einzigen oder ursprünglichen Erfinders: GÜNTER BITZL		Full name of sole or first inventor: GÜNTER BITZL	
Unterschrift des Erfinders	Datum	Inventor's signature	Date
		<i>Günter Bitzl</i>	Aug 27/01
Wohnsitz SINZING, DEUTSCHLAND		Residence SINZING, GERMANY <i>DEV</i>	
Staatsangehörigkeit DEUTSCH		Citizenship GERMAN	
Postanschrift BANATERWEG 10		Post Office Address BANATERWEG 10	
93161 SINZING DEUTSCHLAND		93161 SINZING GERMANY	
Voller Name des zweiten Miterfinders (falls zutreffend): BERND SCHADE		Full name of second joint inventor, if any: BERND SCHADE	
Unterschrift des Erfinders	Datum	Second Inventor's signature	Date
		<i>Bernd Schade</i>	28/08/01
Wohnsitz DUGGENDORF, DEUTSCHLAND		Residence DUGGENDORF, GERMANY <i>DEV</i>	
Staatsangehörigkeit DEUTSCH		Citizenship GERMAN	
Postanschrift BAYERWALDSTRASSE 9		Post Office Address BAYERWALDSTRASSE 9	
93182 DUGGENDORF DEUTSCHLAND		93182 DUGGENDORF GERMANY	

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).

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Voller Name des dritten Miterfinders.		Full name of third joint inventor	
JENS ZEMPELIN		JENS ZEMPELIN	
Unterschrift des Erfinders	Datum	Inventor's signature	Date
		Jens Zempelini	29.08.01
Wohnsitz		Residence	
SINZING, DEUTSCHLAND		SINZING, GERMANY	
Staatsangehörigkeit		Citizenship	
DEUTSCH		GERMAN	
Postanschrift		Post Office Address	
DONAUSTR. 30		DONAUSTR. 30	
93161 SINZING		93161 SINZING	
DEUTSCHLAND		GERMANY	
Voller Name des vierten Miterfinders:		Full name of fourth joint inventor:	
Unterschrift des Erfinders	Datum	Inventor's signature	Date
Wohnsitz		Residence	
Staatsangehörigkeit		Citizenship	
Postanschrift		Post Office Address	
Voller Name des fünften Miterfinders:		Full name of fifth joint inventor:	
Unterschrift des Erfinders	Datum	Inventor's signature	Date
Wohnsitz		Residence	
Staatsangehörigkeit		Citizenship	
Postanschrift		Post Office Address	
Voller Name des sechsten Miterfinders:		Full name of sixth joint inventor:	
Unterschrift des Erfinders	Datum	Inventor's signature	Date
Wohnsitz		Residence	
Staatsangehörigkeit		Citizenship	
Postanschrift		Post Office Address	

(Bitte entsprechende Informationen und Unterschriften im Falle von dritten und weiteren Miterfindern angeben).

(Supply similar information and signature for third and subsequent joint inventors).

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